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Law Offices of Barry N. Young
200 Page Mill Road
Suite 102
Palo Alto, CA 94306-2061

EXAMINER	
GREY, CHRISTOPHER P	

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2474	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/051,396	LOLAYEKAR ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER P. GREY	2474	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 18-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *19-23* is/are allowed.

6)☒ Claim(s) *1-16,18 and 24-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/20/09 has been entered.

Response to Arguments

2. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 9, 30, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Latif et al. (US 6400730) in view of Ibrahim (US 7330892)

Regarding Claim 1, Latif discloses receiving at a first port **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)** of the switch **(fig**

5, notice switch fabric) a packet **(Col 2 lines 55-60 describes receiving a packet)** that specifies as a virtual storage target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** provisioned on a physical storage target **(Col 11 lines 53-63, where the destination fibre channel address is equivalent to the address of the physical target, and is based/provisioned on the IP/virtual address, i.e. Col 5 lines 50-56, notice storage targets).**

sending at a second port **(fig5, notice FC interface equivalent to second port, and Col 2 lines 65-Col 3 line 5, data is routed to a second port)** of the switch **(fig 5, see switch fabric)** the packet to said physical storage target **(Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port).**

Wherein said sending comprises virtualizing said packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to virtualizing)** by translating a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said physical storage target (**Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

Latif makes no mention of buffering in the switch shown in fig 5 or the port shown in fig 15.

Latif does not specifically disclose without buffering.

Ibrahim discloses without buffering the packet **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

Regarding claim 2, Latif does not specifically disclose said virtualizing occurs at wire speed.

Ibrahim discloses said virtualizing occurs at wire speed **(Col 3 lines 15-20 shows wire speed).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

Regarding Claim 9, Latif discloses receiving at a first port **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)** of the switch **(fig 5, notice switch fabric)** a packet **(Col 2 lines 55-60 describes receiving a packet)** that specifies as a virtual storage target **(Col 11 lines 50-55, where the destination IP**

address is equivalent to the address of a virtual target) provisioned on a physical storage target **(Col 11 lines 53-63, where the destination fibre channel address is equivalent to the address of the physical target, and is based/provisioned on the IP/virtual address, i.e. Col 5 lines 50-56, notice storage targets).**

sending at a second port **(fig5, notice FC interface equivalent to second port, and Col 2 lines 65-Col 3 line 5, data is routed to a second port)** of the switch **(fig 5, see switch fabric)** the packet to said physical storage target **(Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port).**

Wherein said sending comprises virtualizing said packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to virtualizing)** by translating a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said physical storage target **(Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

Latif makes no mention of buffering in the switch shown in fig 5 or the port shown in fig 15.

Latif does not specifically disclose at wire speed.

Ibrahim discloses at wire speed **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between**

the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

Regarding claim 30, Latif discloses a port **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)**

Wherein said sending comprises virtualizing said packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to virtualizing)** by translating a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said physical storage target (**Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

Latif makes no mention of buffering in the switch shown in fig 5 or the port shown in fig 15.

Latif does not specifically disclose at wire speed.

Ibrahim discloses at wire speed **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

Regarding claim 31, Latif discloses a plurality of ports **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)**

A plurality of processor units (see fig 15 for plurality of processor units in the ports) wherein each processor unit is associated with at least one respective port (fig 15 shows structure of ports)

Wherein said sending comprises virtualizing said packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to virtualizing)** by translating a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said

physical storage target (**Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

Wherein the virtualization unit (fig 5, the switch is performs virtualization) includes stored virtual target descriptors (fig 12 see IP addresses) and stored physical target descriptors (see figs 12 that show the address table contained within the switch shown in fig 5)

Latif makes no mention of buffering in the switch shown in fig 5 or the port shown in fig 15.

Latif does not specifically disclose at wire speed.

Ibrahim discloses at wire speed **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

3. Claims 3-8, 10-16, 18, 24-29, 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Latif et al. (US 6400730) in view of Ibrahim (US 7330892) in view of Edsall et al. (US 6735198), hereinafter referred to as Edsall.

Regarding claim 3, Latif discloses utilizing the information **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** about the virtual target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** to update the packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to an update)** with the second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of the physical storage target **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target).**

The combined teachings of Latif and Ibrahim do not specifically disclose wherein the first port is located on a first line card and wherein the second port is located on a second line card, The first line card forwarding the packet to the second line card along with information about the virtual target.

Edsall discloses wherein the first port **(fig 5, see ports P0-P2 in LC 1)** is located on a first line card **(fig 5, see 1st line card LC1)** and wherein the second port **(fig 5, see ports P0-P2 of LC2)** is located on a second line card **(fig 5, LC 2 is equivalent to 2nd line card)**, The first line card **(fig 5, see 1st line card LC1)** forwarding the packet (fig 6 shows the fabric frame fwd from the ingress card to the egress card) to the second line card **(fig 5, LC 2 is equivalent to 2nd line card)** along with information about the virtual

target **(fig 6, where a destination index or a VLAN ID is equivalent to virtual target info, i.e. the egress card uses this index to route data to the correct port according to Col 11 lines 22-32).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

<u>Regarding claim 4,</u> Latif discloses wherein the information about the virtual target is obtained from a virtual target descriptor **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)**.

<u>Regarding claim 5,</u> Latif discloses wherein the information about the virtual target is obtained from a virtual target descriptor stored in a memory **(Col 11 lines 45-55, see conversion table equivalent to a memory).**

The combined teachings of Latif and Ibrahim do not specifically disclose on the first line card.

Edsall discloses on the first line card **(where fig 5 shows the forwarding tables, where information about a destination is obtained and inserted into a fabric frame in the ingress line card, such as the information that makes up the fabric frame in fig 6).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as

taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 6, Latif discloses utilizing information about the virtual target to obtain information about said physical target **(Col 11 lines 15-30, where address translation from an IP address to a FC address utilizes such information, and the conversion table assists in doing so).**

The combined teaching of Latif and Ibrahim do not specifically disclose second line card.

Edsall discloses second line card **(fig 5, LC 2).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 7, Latif does not specifically disclose wherein the packet is for a particular request.

Ibrahim discloses wherein the packet is for a particular request (Col 4 lines 1-2, where the host requests for information/packets to be written).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the

network being slowed down and the overall throughput and latency deleteriously being reduced.

The combined teaching of Latif and Ibrahim do not specifically disclose wherein at least one trace tag is associated with the packet and identifies information associated with the request.

Edsall discloses wherein at least one trace tag is associated with the packet and identifies information associated with the request (Col 4 lines 13-25, where the new address that is learned by each line card is equivalent to a trace tag).

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

<u>Regarding claim 8,</u> Latif discloses utilizing the information **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** about the virtual target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** to update the packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to an update)** with the second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of the physical storage target **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target).**

The combined teachings of Latif and Ibrahim do not specifically disclose wherein the first port is located on a first line card and wherein the second port is located on a second line card, The first line card forwarding the packet to a plurality of line cards, including the second line card, along with information about the virtual target, wherein each line card in the plurality of line cards includes a port in communication with a respective physical target device on which the virtual target is provisioned.

Edsall discloses wherein the first port **(fig 5, see ports P0-P2 in LC 1)** is located on a first line card **(fig 5, see 1st line card LC1)** and wherein the second port **(fig 5, see ports P0-P2 of LC2)** is located on a second line card **(fig 5, LC 2 is equivalent to 2nd line card)**, The first line card **(fig 5, see 1st line card LC1)** forwarding the packet to a plurality of line cards (Col 6 lines 10-25, floods the frame to other line cards) to the second line card **(fig 5, LC 2 is equivalent to 2nd line card)** along with information about the virtual target **(fig 6, where a destination index or a VLAN ID is equivalent to virtual target info, i.e. the egress card uses this index to route data to the correct port according to Col 11 lines 22-32),** wherein each line card (fig 5, see line cards) in the plurality of line cards includes a port **(fig 5, see ports P0-P2)** in communication with a respective physical target device **(fig 5, A, B and C are equivalent to target devices)** on which the virtual target is provisioned **(fig 6 shows a virtual address associated with a physical address, which proves provisioning).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes

forwarding tables, avoiding the problems that exist with the tables not having the same information.

<u>**Regarding claim 10,**</u> Latif discloses receiving at a first port **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)** of the switch **(fig 5, notice switch fabric)** a packet **(Col 2 lines 55-60 describes receiving a packet)** that specifies as a virtual storage target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** provisioned on a physical storage target **(Col 11 lines 53-63, where the destination fibre channel address is equivalent to the address of the physical target, and is based/provisioned on the IP/virtual address, i.e. Col 5 lines 50-56, notice storage targets).**

utilizing the information **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** about the virtual target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** to update the packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to an update)** with the second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of the physical storage target **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target).**

translating a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual**

storage target) to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said physical storage target **(Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

Latif makes no mention of buffering in the switch shown in fig 5 or the port shown in fig 15.

Latif does not specifically disclose without buffering.

Ibrahim discloses without buffering the packet **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

The combined teachings of Latif and Ibrahim do not specifically disclose wherein the first port is located on a first line card and wherein the second port is located on a second line card, The first line card forwarding the packet to the second line card along with information about the virtual target. Sending by the second line card the packet to the physical storage target.

Edsall discloses wherein the first port **(fig 5, see ports P0-P2 in LC 1)** is located on a first line card **(fig 5, see 1st line card LC1)** and wherein the second port **(fig 5, see ports P0-P2 of LC2)** is located on a second line card **(fig 5, LC 2 is equivalent to 2nd line card)**, The first line card **(fig 5, see 1st line card LC1)** forwarding the packet (fig 6 shows the fabric frame fwd from the ingress card to the egress card) to the second line card **(fig 5, LC 2 is equivalent to 2nd line card)** along with information about the virtual target **(fig 6, where a destination index or a VLAN ID is equivalent to virtual target info, i.e. the egress card uses this index to route data to the correct port according to Col 11 lines 22-32).**

Sending by the second line card the packet to the physical storage target **(Col 11 lines 10-22, frame is transmitted to the egress line card that the station is attached to).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 11, Latif does not specifically disclose said virtualizing occurs at wire speed.

Ibrahim discloses said virtualizing occurs at wire speed **(Col 3 lines 15-20 shows wire speed).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

Regarding claim 12, Latif discloses receiving at a first port **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)** of the switch **(fig 5, notice switch fabric)** a packet **(Col 2 lines 55-60 describes receiving a packet)** that specifies as a virtual storage target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** provisioned on a physical storage target **(Col 11 lines 53-63, where the destination fibre channel address is equivalent to the address of the physical target, and is based/provisioned on the IP/virtual address, i.e. Col 5 lines 50-56, notice storage targets).**

utilizing the information **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** about the virtual target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** to update the packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to an update)** with the second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of the physical storage target **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target).**

translating a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said physical storage target (**Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

Latif makes no mention of buffering in the switch shown in fig 5 or the port shown in fig 15.

Latif does not specifically disclose without buffering.

Ibrahim discloses without buffering the packet **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

The combined teachings of Latif and Ibrahim do not specifically disclose wherein the first port is located on a first line card and wherein the second port is located on a second line card, The first line card forwarding the packet to a plurality of line cards,

including the second line card, along with information about the virtual target, wherein each line card in the plurality of line cards includes a port in communication with a respective physical target device on which the virtual target is provisioned.

Edsall discloses wherein the first port **(fig 5, see ports P0-P2 in LC 1)** is located on a first line card **(fig 5, see 1st line card LC1)** and wherein the second port **(fig 5, see ports P0-P2 of LC2)** is located on a second line card **(fig 5, LC 2 is equivalent to 2nd line card)**, The first line card **(fig 5, see 1st line card LC1)** forwarding the packet to a plurality of line cards (Col 6 lines 10-25, floods the frame to other line cards) to the second line card **(fig 5, LC 2 is equivalent to 2nd line card)** along with information about the virtual target **(fig 6, where a destination index or a VLAN ID is equivalent to virtual target info, i.e. the egress card uses this index to route data to the correct port according to Col 11 lines 22-32),** wherein each line card (fig 5, see line cards) in the plurality of line cards includes a port **(fig 5, see ports P0-P2)** in communication with a respective physical target device **(fig 5, A, B and C are equivalent to target devices)** on which the virtual target is provisioned **(fig 6 shows a virtual address associated with a physical address, which proves provisioning).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 13, Latif does not specifically disclose said virtualizing occurs at wire speed.

Ibrahim discloses said virtualizing occurs at wire speed **(Col 3 lines 15-20 shows wire speed).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

Regarding claim 14, Latif discloses receiving at a first port **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)** of the switch **(fig 5, notice switch fabric)** a packet **(Col 2 lines 55-60 describes receiving a packet)** that specifies as a virtual storage target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** provisioned on a physical storage target **(Col 11 lines 53-63, where the destination fibre channel address is equivalent to the address of the physical target, and is based/provisioned on the IP/virtual address, i.e. Col 5 lines 50-56, notice storage targets).**

Using the information **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** about the virtual target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** to update the packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to an update)** with the second address

(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target) of the physical storage target **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target).**

Converting a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said physical storage target (**Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

Latif makes no mention of buffering in the switch shown in fig 5 or the port shown in fig 15.

Latif does not specifically disclose without buffering.

Ibrahim discloses without buffering the packet **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the

network being slowed down and the overall throughput and latency deleteriously being reduced.

The combined teachings of Latif and Ibrahim do not specifically disclose an ingress line card, the information including a flowID for routing the packet through the switch, and the ingress line card placing a virtual target descriptor identifier and the flow ID, in a local header of the packet, the ingress line card forwarding the packet to a fabric, which forwards the packet to an egress line card in accordance with the flow ID, And an egress line card.

Edsall discloses an ingress line card (fig 5, see line cards, where the source line card is equivalent to an ingress), the information including a flowID (fig 6, see POE bit vector) for routing the packet through the switch (Col 9 lines 49-51, instructing the switch fabric as to which line card), and the ingress line card (fig 5, LC 1, line card 1 equivalent to ingress line card) placing a virtual target descriptor identifier (fig 6, VLAN ID or dest index is equivalent to virtual descriptor) and the flow ID (fig 6, see POE bit vector), in a local header of the packet (fig 6, fabric header), the ingress line card (fig 5, LC 1, line card 1 equivalent to ingress line card) forwarding the packet to a fabric (fig 6, LC 1 fwds packet to switch fabric 550), which forwards the packet to an egress line card (fig 5, dest line card such as LC 2 is equivalent to egress) in accordance with the flow ID (Col 9 lines 49-51, POE bit vector instructing the switch fabric as to which line card),

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes

forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 15, Latif does not specifically disclose wherein the packet is for a particular request.

Ibrahim discloses wherein the packet is for a particular request (Col 4 lines 1-2, where the host requests for information/packets to be written).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

The combined teaching of Latif and Ibrahim do not specifically disclose wherein at least one trace tag is associated with the packet and identifies information associated with the request, the egress line card including the trace tag as a source identifier with the packet sent.

Edsall discloses wherein at least one trace tag is associated with the packet and identifies information associated with the request (Col 4 lines 13-25, where the new address that is learned by each line card is equivalent to a trace tag), the egress line card including the trace tag as a source identifier with the packet sent (Col 6 lines 40-5, where each forwards engine of the flooded line cards learn the source address).

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as

taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 16, Latif does not specifically disclose said virtualizing occurs at wire speed.

Ibrahim discloses said virtualizing occurs at wire speed **(Col 3 lines 15-20 shows wire speed).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

Regarding claim 18, Latif discloses a table for storing translation information including identifiers, where one skilled in the art interprets a table as memory such as a CAM or SRAM.

Furthermore, the line cards of Edsall teach forwarding tables (see fig 5), where such tables are interpreted as memories such as CAM's or SRAM's.

Regarding claim 24, Latif discloses receiving at a first port **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)** of the switch **(fig 5, notice switch fabric)** a packet **(Col 2 lines 55-60 describes receiving a packet)**

A processor unit associated with and in communication with the port **(figs 15 and 16, see routing logic).**

translating a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** provisioned on a physical storage target **(Col 11 lines 53-63, where the destination fibre channel address is equivalent to the address of the physical target, and is based/provisioned on the IP/virtual address, i.e. Col 5 lines 50-56, notice storage targets)** to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said physical storage target **(Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

Latif does not specifically disclose without buffering.

Ibrahim discloses without buffering the packet **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

The combined teachings of Latif and Ibrahim do not specifically disclose a plurality of line cards and wherein the switch further comprises a CPU in communication with the processor unit, the CPU sending the processor unit a virtual target descriptor with information for the processor unit to operate on data for said virtual storage target.

Esdall discloses a plurality of line cards (see fig 5 plurality of LC's).

wherein the switch further comprises a CPU (fig 5, where the combination of the EARL and LTL are equivalent to CPU) in communication with the processor unit (fig 5, the port is equivalent to a processor unit), the CPU sending the processor unit a virtual target descriptor (fig 6, where the port circuitry appends a header including dest index and VLAN ID in the line card) with information for the processor unit to operate on data for said virtual storage target (the operation of appending the fabric header with information).

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 25, Latif does not specifically disclose said virtualizing occurs at wire speed.

Ibrahim discloses said virtualizing occurs at wire speed **(Col 3 lines 15-20 shows wire speed).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

Regarding claim 26, The combined teachings of Latif and Ibrahim do not specifically disclose wherein each line card includes a plurality of ports and a plurality of processor units, wherein each processor unit is in communication with at least one respective port.

Edsall discloses wherein each line card includes a plurality of ports and a plurality of processor units, wherein each processor unit is in communication with at least one respective port (see fig 5, where each line card contains a number of components).

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 27, The combined teachings of Latif and Ibrahim do not specifically disclose the processor unit including a PACE and a PPU.

Edsall discloses a PACE (fig 5, LTL) and a PPU (UDLINK).

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 28, Latif discloses a table for storing translation information including identifiers, where one skilled in the art interprets a table as memory such as a CAM or SRAM.

Furthermore, the line cards of Edsall teach forwarding tables (see fig 5), where such tables are interpreted as memories such as CAM's or SRAM's.

Regarding claim 29, Latif discloses receiving at a first port **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)** of the switch **(fig 5, notice switch fabric)** a packet **(Col 2 lines 55-60 describes receiving a packet)**

A processor unit (fig 15 each port contains a number of processors) coupled to a traffic manager (fig 5, 250 shows management processor), which is coupled to a fabric (fig 5, 240 shows fabric) for routing packets from an ingress (fig 5, 250 is ingress) to an egress **(fig 5, see ports and interfaces for egress).**

translating a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** provisioned on a physical storage target **(Col 11 lines 53-63, where the destination fibre channel address is equivalent to the address of the physical**

target, and is based/provisioned on the IP/virtual address, i.e. Col 5 lines 50-56, notice storage targets) to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said physical storage target **(Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

each port is associated with a respective processor unit (fig 15 and 16 show routing logic/processor) which is coupled to a management processor (traffic manager) such as fig 5 250.

Latif does not specifically disclose at wire speed.

Ibrahim discloses at wire speed **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

The combined teaching of Latif and Ibrahim do not specifically disclose a plurality of line cards.

Edsall discloses a plurality of line cards (see fig 5, LC's).

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 32, Latif discloses a plurality of ports **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)**

Wherein said sending comprises virtualizing said packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to virtualizing)** by translating a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said physical storage target (**Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

Latif makes no mention of buffering in the switch shown in fig 5 or the port shown in fig 15.

Latif does not specifically disclose at wire speed.

Ibrahim discloses at wire speed **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between**

the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

The combined teaching of Latif and Ibrahim do not specifically disclose a plurality of line cards.

Edsall discloses a plurality of line cards (see fig 5, LC's).

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 33, Latif does not specifically disclose said virtualizing occurs at wire speed.

Ibrahim discloses said virtualizing occurs at wire speed **(Col 3 lines 15-20 shows wire speed).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the

network being slowed down and the overall throughput and latency deleteriously being reduced.

Regarding claim 34, Latif discloses receiving at a first port **(fig 5, notice ports/interfaces in fig 5, where 270-5 includes an IP port interface)** of the switch **(fig 5, notice switch fabric)** a packet **(Col 2 lines 55-60 describes receiving a packet)** that specifies as a virtual storage target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** provisioned on a physical storage target **(Col 11 lines 53-63, where the destination fibre channel address is equivalent to the address of the physical target, and is based/provisioned on the IP/virtual address, i.e. Col 5 lines 50-56, notice storage targets).**

utilizing the information **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** about the virtual target **(Col 11 lines 50-55, where the destination IP address is equivalent to the address of a virtual target)** to update the packet **(Col 11 lines 15-30, where address translation from an IP address to a FC address is equivalent to an update)** with the second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of the physical storage target **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target).**

translating a first address **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual storage target)** of said virtual storage target **(Col 11 lines 15-30, where an IP address is equivalent to a first address of a virtual**

storage target) to a second address **(Col 11 lines 15-30, where the FC address is equivalent to a second address and is the address of the physical target)** of said physical storage target **(Col 3 lines 1-5, packet is transmitted to a second network device coupled to the second port, i.e. Col 5 lines 50-56, notice storage targets)**

Latif makes no mention of buffering in the switch shown in fig 5 or the port shown in fig 15.

Latif does not specifically disclose without buffering.

Ibrahim discloses without buffering the packet **(Col 4 lines 59-63 shows that the mappings of the virtual to the physical are performed, and data transfer is performed between the host and the storage device at wire speed, i.e. notice fig 3, where the elements within 302, have no need for a buffer).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

The combined teachings of Latif and Ibrahim do not specifically disclose wherein the first port is located on a first line card and wherein the second port is located on a second line card, The first line card forwarding the packet to a plurality of line cards, including the second line card, along with information about the virtual target, wherein each line card in the plurality of line cards includes a port in communication with a respective physical target device on which the virtual target is provisioned.

Edsall discloses wherein the first port **(fig 5, see ports P0-P2 in LC 1)** is located on a first line card **(fig 5, see 1st line card LC1)** and wherein the second port **(fig 5, see ports P0-P2 of LC2)** is located on a second line card **(fig 5, LC 2 is equivalent to 2nd line card)**, The first line card **(fig 5, see 1st line card LC1)** forwarding the packet to a plurality of line cards (Col 6 lines 10-25, floods the frame to other line cards) to the second line card **(fig 5, LC 2 is equivalent to 2nd line card)** along with information about the virtual target **(fig 6, where a destination index or a VLAN ID is equivalent to virtual target info, i.e. the egress card uses this index to route data to the correct port according to Col 11 lines 22-32),** wherein each line card (fig 5, see line cards) in the plurality of line cards includes a port **(fig 5, see ports P0-P2)** in communication with a respective physical target device **(fig 5, A, B and C are equivalent to target devices)** on which the virtual target is provisioned **(fig 6 shows a virtual address associated with a physical address, which proves provisioning).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention was disclosed to modify the combined teachings of Latif and Ibrahim, as taught by Edsall, since stated in Col 4 lines 1-12, that such a modification synchronizes forwarding tables, avoiding the problems that exist with the tables not having the same information.

Regarding claim 35, Latif does not specifically disclose said virtualizing occurs at wire speed.

Ibrahim discloses said virtualizing occurs at wire speed **(Col 3 lines 15-20 shows wire speed).**

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the switch apparatus of Latif, as taught by Ibrahim, since stated in Col 1 lines 60-65, that such a modification will overcome the effects of traffic on the network being slowed down and the overall throughput and latency deleteriously being reduced.

Allowable Subject Matter

4. Claims 19-23 are allowed (maintained from previous office action).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER P. GREY whose telephone number is (571)272-3160. The examiner can normally be reached on 10AM-7:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Moe Aung can be reached on (571)272-7314. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aung S. Moe/
Supervisory Patent Examiner, Art Unit 2474

/Christopher P Grey/
Examiner, Art Unit 2474